Amendments to the Specification:

In the SUMMARY OF THE INVENTION,
please replace the last paragraph on page 11 with the following amended paragraph:

An even further method is to produce threshold levels along a non-linear curve, i.e. by not spreading ~~the~~ said threshold ~~points~~ levels with equal distances in order to get a desired non-linear relation of the total capacitance change versus tuning voltage.

In the DESCRIPTION OF THE PREFERRED EMBODIMENTS,
please replace the last paragraph starting at page 16 with the following amended paragraph:

A single capacitor switching stage, as shown in **Fig. 5**, contains a circuit to control the switching operation **Switch-Ctrl** (also called hereafter the switch control circuit), a switching device **SW** and a small capacitor **Cap**. Said circuit to control the switching operation receives a signal, dependent on the tuning voltage **Vtune**, an input reference signal **Ref-in-5** and an output reference signal **Ref-out-5**. The translinear amplifier in **Fig. 5**, imbedded within said circuit to control the switching operation **Switch-Ctrl**, possibly together with some glue components, compares the differential voltage at its inputs **Vinp-5** and **Vinn-5** and, through various current mirroring techniques, provides the same differential voltage at its outputs **Voutp-5** and **Voutn-5**; i.e. the output difference of said amplifier strictly follows the difference at said amplifier inputs, independent of the absolute voltage level at the outputs. Said switch control circuit **Switch-Ctrl** then provides a switch control signal **Vsw**, based on said~~The~~

translinear amplifier's output signal to said switching device **SW**. Switch control signal **Vsw** then drives ~~said~~ a current switching device **N1-5** with the gate voltage **Vg-5** to switch on said individual small capacitor **Cap-5** in the proposed steady ramp-up/ramp-down manner. The result is the variable capacitance **Var-Cap-5** of said single capacitor switching stage.

Please replace the last paragraph starting at page 16 with the following amended paragraph:

Each of said translinear amplifiers can operate at a different absolute voltage level at their input and work independent at another output level. In this way the network to generate the reference voltages can be optimized independently for each stage, because the voltage level best suitable for the control operation of each switching transistor can be freely selected. In the circuit shown in **Fig. 6** as an example, the reference voltages are produced in a simple chain of resistors. The translinear amplifiers **Tr.Amp 1** to **Tr.Amp n**, imbedded into said switch control circuit **Switch-Ctrl**, can adjust between said input reference voltage levels **Ref-in 1** to **Ref-in n** and the output reference levels **Ref-out-1** to **Ref-out-n**. Said translinear amplifiers then control the switching transistors **Sw 1** to **Sw n**, which in turn switch on the individual small capacitors **Cap 1** to **Cap n** in the proposed steady ramp-up/ramp-down manner. The combination of one translinear amplifier **Tr.Amp k**, combined with adequate control circuit and one switching device **Sw k** could be considered as an individual capacitor switching stage, where one of said capacitor switching stages connects to one capacitor **Cap k** out of a set of small capacitors. Each of said capacitor switching stages is

controlled through the common input **Vtune** and an individual input reference **Ref-in k**. All of these stages k = 1 to n have basically identical functional characteristics.In the same way as described in said related patent application US Serial No. 10/764920, within a set of small capacitors **Cap 1** to **Cap n**, one capacitor after the other is switched in parallel to change the total capacity. Each capacitor has its individual switching device **Sw 1** to **Sw n.** To achieve a linear capacitance change, said capacitors are not switched on one by one in digital steps, however each capacitor is switched on partially in a sliding operation, starting at low value (0 % of its capacitance) and ending with the fully switched on capacitor (100 % of its capacitance). To achieve said sliding switch operation, a typical implementation uses FET- type transistors, one per capacitor. The switching operation of such FET-transistor can be divided into three phases: the fully-switched-off phase (the FET transistor's drain-source-resistance RDS is very high), a steady ramp-up/ramp-down phase or steady transition phase, where the series resistance of said FET-transistor linearly follows the gate voltage and steadily changes from high to low values or vice versa, and the fully-switched-on phase (said FET transistor's drain-source-resistance RDS is very low). **Fig. 10b** in US Patent Application Serial No. 10/764920, included by reference, visualizes the principal RDSon characteristic versus gate voltage of the switching devices **N1-5** of a single capacitor switching stage according to **Fig. 5** of the present application. By thoroughly controlling such switching device within said steady ramp-up/ramp-down or steady transition area, the capacitor in series with said switching device is effectively switched in parallel to the other capacitors with a well-controlled proportion between 0 % and 100 %. "Steady" is meant in the mathematical sense of being free of jumps or breaks. The limits of said steady ramp-up/ramp-down or steady transition area is distinguished by the points, where a further change of the controlling signal of the switch does not lead to further

decrease or increase of the series resistance of said switching device (except for a small, negligible change).

Please replace the 1st and 2nd paragraph starting at page 22 with the following 2 amended paragraphs:

There are various techniques for a circuit to generate a set of input reference values and provide the threshold levels to each of said capacitor switching stages. And there are various techniques ~~for a circuit~~ to provide a suitable input signal, dependent on the tuning voltage **Vtune**, dedicated for the voltage controlled capacitance change, to all of said capacitor switching stages. As shown in **Fig. 6** and **Fig. 9**, one solution for said circuit to generate a set of input reference values is a simple resistor chain. A possible and minimal, though not the only, solution for a circuit to ~~provide~~ propagate the input threshold levels **Ref-in n** ~~to each of said capacitor switching stages~~ and ~~for a circuit~~ to ~~provide~~ propagate ~~a signal, dependent on~~ the tuning voltage **Vtune** ~~and dedicated for the voltage controlled capacitance change~~, ~~to all of said capacitor~~ from inputs of said switching ~~stages~~ control circuit **Switch-Ctrl** to the therin embedded translinear amplifier, is to connect said individual threshold level~~s~~, as well as said tuning voltage, with simple wire connections to the appropriate input lines of said translinear amplifier~~s~~, without using any further intermittent electronic glue components, as anticipated inside said switching control circuit **Switch-Ctrl** in **Fig. 5** and **Fig. 6**.

Similarly, the output reference levels could be provided for example through a resistor network to provide individual output reference levels for each translinear

amplifier (**Ref-out-1** to **Ref-out-n** in **Fig. 6**). ~~Or,~~ A possible and minimal solution to provide the identical output reference level to all translinear amplifiers, a single signal could ~~be~~ connect~~ed to~~ all ~~inputs~~ output reference points ~~**Ref-out-1 to Ref-out-n**~~ of all translinear amplifiers (~~as indicated~~equivalent to **Ref-out-1** to **Ref-out-n** in **Fig. 6**) to a common output reference level **C-Ref-out**, as indicated in **Fig. 9**.

Please replace the 1st and 2nd paragraph starting at page 24 with the following amended paragraph:

A possible solution for said signal cutoff functions could be to implement said signal cutoff functions as separate circuits in combination with, but external to said translinear amplifier. As long as the capacitor switching device operates inside its **steady ramp-up/ramp-down area** in **Fig. 7**, the translinear amplifier controls the linear operation. However, when said steady ramp-up/ramp-down area is exceeded, one of the two additional signal cut-off circuits overrides the translinear amplifier's output , thus taking over the control of the capacitor switching device. The point where the cut-off circuits take over control are said cutoff edges **CutOff Lo** and **CutOff Hi** as presented in **Fig. 7**.

The principal concept of said separate circuits for said signal cutoff functions is shown in **Fig. 10a**, which shows the two signal cut-off circuits **CutOffC-Lo** and **CutOffC-Hi**, in addition to said (main) circuit to control the switching operation **Switch-Ctrl**, as shown in **Fig. 5**. The outputs of all three control circuits operate together (functionally similar to a dotted-OR connection) to drive said switching device; thus each

cut-off circuit can override the output of the **Switch-Ctrl** circuit once the switching device leaves the desired steady transition area ~~Switching devices **N3-10** and **N4-10**~~ Signal-cut-off circuit **CutOffC-Lo** and signal-cut-off circuit **CutOffC-Hi** symbolize two circuits to drive said switching device to a fully on (i.e. low impedance) or fully off (i.e. high impedance) state, when said capacitor switching device operates outside said steady ramp-up/ramp-down area ~~on the said switching device's low resistance side or high resistance side~~. . Appropriate threshold elements detect the limits **CutOff Lo** and **CutOff Hi** of the steady ramp-up/ramp-down area, as shown in **Fig. 7** and as explained above. Said threshold elements then provide ~~T~~the two control signals **CtlCutOff Lo** and **CtlCutOff Hi** to either force said fully on or fully off state are ~~**CtlCutOff Lo** and **CtlCutOff Hi**~~, which control two switching devices **N3-10** and **N4-10** in **Fig. 10a**.

Please replace the 1st and 2nd paragraph at page 25 with the following 2 amended paragraphs:

According to said second aspect, two additional circuit functions sharply limit the analog operating region through an extra current limiting transistor on one side and the purposely use of the voltage limited by the power supply on the other side. Key objective is to linearly control said translinear amplifier's output, for example for switching on or off a transistor in an application like it is shown in **Fig. 4** ~~(~~of the referenced ~~application~~ Patent Application US Serial No. 10/676919~~)~~, and getting sharp cutoff edges, for example for switching on or off a transistor in said application to achieve minimum RDSon and maximum of RDSoff at the extreme ends. The desired output characteristic is visualized in **Fig. 5** (of the referenced application).

In **Fig. 5** of the referenced ~~application~~ Patent Application US Serial No. 10/676919 and described there on page 15, 2nd full paragraph, the linear operating region on line **50b** is marked as the area **59**. Once either output **Vout-p** or **Vout-n** reaches the cutoff voltage **Vlim** at point **59a** or when it reaches the power supply line **Vdd** at point **59b**, the linear operation is sharply cut off.

Please replace the last paragraph at page 26 and continuing to page 27 with the following amended paragraph:

Fig. 9 shows a realistic circuit diagram of an implementation, in accordance with an embodiment of this invention. **Tr.Amp 1** to **Tr.Amp n** are said translinear amplifiers, **Sw 1** to **Sw n** are the switching devices and **Cap 1** to **Cap n** are said capacitors that will be switched in parallel, resulting in the total capacitance **varCap**. **R1** to **Rn** build the resistor chain to produce references voltages for the amplifier of each stage, as already shown in Fig. 6. Similar to **Fig. 7**, the combination of one translinear amplifier **Tr.Amp k**, combined with adequate control circuit and one switching device **Sw k** could be considered as an individual capacitor switching stage, where one of said capacitor switching stages connects to one capacitor **Cap k** out of a set of small capacitors. Each of said capacitor switching stages is controlled through the common input **Vtune** and an individual input reference point **Ref-in k**. In the implementation shown in **Fig. 9**, the output reference points **Ref-out k** of Fig. 6 are all connected to a common output ~~R~~reference point ~~**Vref.**~~ **C-Ref-out.**

All of these stages k = 1 to n have basically identical functional characteristics.

Please replace the 2nd paragraph at page 27 with the following amended 2 paragraphs; please note, the just mentioned paragraph is now split in 2 paragraphs:

Furthermore, a concept of this disclosure is to compensate the temperature deviation, caused by the temperature characteristics of the switching device; **Fig. 10b** presents this concept, which shows a temperature compensating circuit **Temp-Comp** in addition to said circuit to control the switching operation **Switch-Ctrl**, as shown in **Fig. 5**. One method is to use a device **N2-10** of the identical type of the switching device **N1-10** to produce a temperature dependent signal and feed it as compensating voltage **Vref-10** into the output reference point **Voutn-10** of the translinear amplifier. This will mirror the exact equivalent of the temperature error into the switching control signal **Vg-10** and compensate its temperature error. The output reference point **Voutn-10** in **Fig. 10b** is the same point as the reference points~~s~~ **Ref-out** ~~1 to **Ref-out n**~~ in **Fig. ~~6~~5**.

The total capacitance versus tuning voltage characteristic for a circuit with n-stages is demonstrated in **Fig. 11a** and the overall characteristic of said Q-factor is presented in **Fig. 11b**.